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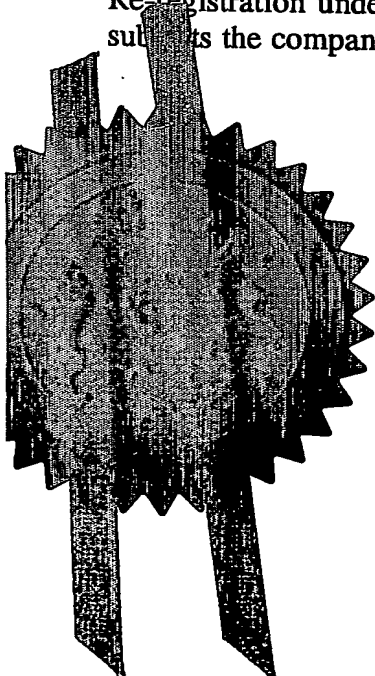
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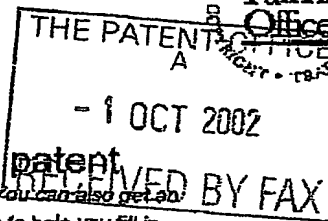
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01OCT02 E752337-1-002401
P01/7700 0.00-0222661.1

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2. Patent application number
(The Patent Office will fill in this part)
01 OCT 2002 0222661.1
3. Full name, address and postcode of the or of each applicant (underline all surnames)
Christopher Charles Macintosh Buntain
8 Park Avenue
Greenock
Renfrewshire
PA 16 7QX

08242190001
Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation
4. Title of the invention
Insulated Building Component
5. Name of your agent (if you have one)
Murgitroyd & Company

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)
Scotland House
165-169 Scotland Street
Glasgow
G5 8PL

Patents ADP number (if you know it)
1198015
6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country	Priority application number (if you know it)	Date of filing (day / month / year)
7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing (day / month / year)
8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:
 - a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.
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Description 15

Claim(s) -

Abstract -

Drawing(s) 8

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Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11. I/We request the grant of a patent on the basis of this application

Signature *Murgitroyd & Company* Date

Murgitroyd & Company

1 October 2002

12. Name and daytime telephone number of person to contact in the United Kingdom

GORDON, Naolise

0141 307 8400

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1

1 INSULATED WALL ASSEMBLY

2

3 The present invention relates to a structural
4 component and an insulated wall assembly formed
5 using the structural component.

6

7 There is requirement under building regulations in
8 the United Kingdom to provide a certain standard of
9 insulation for all building structures. In wall
10 construction this is presently achieved by inserting
11 various insulating materials into cavities in the
12 wall structure and various methods of insulating
13 these cavities have developed over the years. More
14 recently, in order to increase the volume of the
15 cavity available for insulation, framed construction
16 of timber or steel has been employed. Framed
17 construction is structural and has the advantage of
18 lending itself to prefabrication.

19

20 In all cases, the amount of insulation insertable
21 into the cavity is limited by the size of the
22 cavity, e.g. the distance between the internal leaf

2

1 and external leaf forming a masonry cavity wall.
2 However, in this case the size of the cavity is
3 limited by structural considerations. To place the
4 internal leaf and external leaf too far apart would
5 create a structurally unsound wall which may
6 collapse over time. To offset this and to maximise
7 the size of cavity available for insulation, wall
8 ties are employed to create anchoring points
9 connecting the inner leaf and outer leaf together,
10 thus lending structural stability to the wall.
11 Demands for greater insulation will necessitate the
12 use of longer wall ties but their length will be
13 constrained by the ability of the wall to act as a
14 structural composite and remain stable. In short, a
15 balance must be struck between the size of the
16 cavity and the minimum insulation which is necessary
17 to insulate the building structure. However, the
18 thickness of insulation required to meet the
19 regulations in the future may result in the demise
20 of the masonry cavity wall as a form of load bearing
21 construction.
22
23 Framed construction is an attractive alternative as
24 it offers speed of erection, prefabrication off
25 site, and is less dependant on traditional skills
26 and materials. While offering extensive cavities
27 for insulating it is not complete in itself and
28 requires the application of weatherproof cladding
29 and an internal lining.
30
31 As building standards and environmental regulations
32 become more stringent, greater amounts of insulation

3

1 and better insulation methods will be required.
2 Consideration has also to be given to the
3 positioning of the insulation in the wall
4 construction to avoid the risk of harmful
5 condensation forming.

6
7 More recently, methods of insulating cavity walls
8 provide for a partial fill of the cavity with
9 insulation, such that a portion of the cavity still
10 remains between the outer face of the insulation and
11 the inner face of the external leaf of the cavity
12 wall. This is done in order to prevent cold
13 bridging between the outer leaf and inner leaf of
14 the cavity wall and to prevent the ingress of
15 moisture thereacross. This, however, reduces even
16 further the amount of insulation in the cavity.

17
18 To date, insulating the external face of the outer
19 leaf of the cavity wall has not been an option. To
20 employ the methods and materials used to date would
21 not be suitable for this purpose.

22
23 The application of insulation to the outer surface
24 of a cavity masonry wall would have the benefits of
25 providing better insulation standards, good weather
26 defences and a sound structure. Presently, such
27 application would be dependent on traditional
28 constructional skills and materials and would not
29 lend itself to fast methods of construction.

30
31 It is an objection of the invention to overcome the
32 problems of the prior art.

4

1 According to the invention there is provided a
2 structural component for a wall construction
3 assembly, comprising a web and first and second
4 flange portions, the first and second flange
5 portions being attachable to respective wall panels,
6 the structural component further comprising a first
7 fin extending from the web portion in a
8 substantially lateral direction thereto.

9
10 Preferably, the structural component has a second
11 fin extending from the web portion in a direction
12 opposite to that of the first fin.

13
14 Preferably, the first and second fins are co-planar
15 and extend from the web portion to form an angle of
16 90° with the web portion.

17
18 Optionally, the structural component has a plurality
19 of first and second fins extending from the web
20 portion, such that each pair of first and second
21 fins are co-planar and extend from opposite sides of
22 the web portion.

23
24 Preferably, the first and second fins have a free
25 end.

26
27 Preferably, the free end of the first and/or second
28 fins is adapted for complementary engagement with
29 cladding accessories, for example, insulation
30 restraining straps, bars or panels.

31

5

1 Preferably, the free end of the first and/or second
2 fins has a slot for receiving the cladding
3 accessories.

4
5 Preferably, the slot is adapted to resist withdrawal
6 of the cladding accessory after its insertion
7 therein.

8
9 Preferably, the first and second flange portions of
10 the structural component have slots in opposite
11 sides thereof for receiving cladding accessories for
12 example, insulation restraining straps, bars or
13 panels.

14
15 Preferably, an end wall of the first and/or second
16 flange portions of the structural component are
17 grooved to receive adhesive to secure the first
18 and/or second flange portions to the respective wall
19 panels. Conventional securing means can also be
20 used, for example, a nut and bolt, screw or rivet.

21
22 Typically, the structural component is made of a
23 strong, lightweight material, for example,
24 aluminium, steel, alloy or glass reinforced
25 composite. Preferably the structural component is
26 an extrusion.

27
28 According to a further aspect of the present
29 invention there is provided a wall construction
30 assembly, comprising a plurality of spaced
31 structural components, each structural component
32 comprising a web, first and second flange portions,

6

1 and one or more pairs of opposed first and second
2 fins extending from the web portion in a
3 substantially lateral direction thereto, the
4 assembly further comprising at least one wall panel
5 connected to one of the first and second flange
6 portions and insulation held between adjacent
7 structural components.

8

9 Preferably, the assembly has a second wall panel
10 connected to the other of the first and second
11 flange portions.

12

13 Preferably, the assembly has insulation disposed
14 between the first and second fins of the structural
15 component, and the first and/or second wall panel,
16 the insulation extending between adjacent structural
17 components.

18

19 Preferably, the first and second flange portions of
20 the structural component have slots in opposite
21 sides thereof for receiving cladding accessories for
22 example, insulation restraining straps, bars or
23 panels.

24

25 Preferably, the free end of the first and/or second
26 fins is adapted for complementary engagement with
27 cladding accessories, for example, insulation
28 restraining straps, bars or panels. In this way, the
29 restraining means can divide the insulating body
30 into compartments which can be filled with different
31 types of insulating material or can be left empty as
32 desired.

7

1 Preferably, the free end of the first and/or second
2 fins has a slot for receiving the cladding
3 accessory. The cladding accessory may be a rigid
4 strap spanning between adjacent structural
5 components.

6
7 Preferably, the slot is adapted to resist withdrawal
8 of the cladding accessory after its insertion
9 therein.

10
11 Preferably, each structural component comprises a
12 plurality of pairs of opposed first and second fins
13 extending from the web portion in a substantially
14 lateral direction thereto, arranged at a regular
15 spacing along the web. Preferably, the spacing
16 along the web between the pairs of fins is
17 substantially equal to the spacing along the web
18 between the first flange and the pair of fins
19 adjacent to the first flange. Preferably, the
20 spacing along the web between the pairs of fins is
21 substantially equal to the spacing along the web
22 between the second flange and the pair of fins
23 adjacent to the second flange.

24
25 Preferably, an end wall of the first and/or second
26 flange portions of are grooved to receive adhesive
27 to secure the first and/or second flanged portions
28 to the respective wall panels. Conventional
29 securing means can also be used, for example, nut
30 and bolt, screw or rivet.

31

8

1 Optionally the first and/or second wall panels can
2 comprise two or more wall panels.

3
4 Preferably, there is provided a ventilation space
5 between the first and/or second flange portions of
6 the structural component and the first and/or second
7 wall panels.

8
9 This ventilation space may be provided by a spacing
10 member extending between the first and/or second
11 flange portions and the first and/or second wall
12 panels.

13
14 The ventilation space may also be provided or
15 increased by removing the insulation between the
16 first and second fins and the first and/or second
17 flange portions.

18
19 An embodiment of the invention will now be
20 described, by way of example only, having regard to
21 the accompanying drawings in which:-

22
23 Fig. 1 is a cross sectional plan view of a
24 structural component in accordance with the
25 invention;

26
27 Fig. 2 is cross-sectional plan view of a wall
28 construction assembly in accordance with the
29 invention showing the structural component of Fig.
30 1;

31

9

1 Fig. 3 is a cross-sectional perspective view from
2 above of the wall construction assembly of Fig. 2;

3
4 Fig. 4 is an exploded view of the first wall panel
5 of Fig. 2 and Fig. 3;

6
7 Fig. 5 shows the second flange portion of the
8 insulating component of Fig. 2 attached to the wall
9 panel in a different manner;

10
11 Fig. 6 shows the second flange portion of the
12 structural component attached directly to a masonry
13 wall and to a structural steel member;

14
15 Fig. 7 shows the first flange portion of the
16 structural component attached to a cladding panel;

17
18 Fig. 8 is an enlarged view of Fig. 7 without the
19 cladding panel and showing the insulation straps;

20
21 Fig. 9 shows the first flange portion of the
22 structural component attached to a masonry wall and
23 the second flange portion of the structural
24 component attached to a wall panel;

25
26 Fig. 10 shows use of the structural component in a
27 conventional cavity wall;

28
29 Fig. 11 shows a structural component having three
30 pairs of fins; and

31

10

1 Fig. 12 shows a structural component having a single
2 pair of fins.

3
4 Referring to the drawings and initially to Fig. 1,
5 there is shown a structural component generally
6 indicated by the reference numeral 1, having a
7 central web portion 2, first and second generally
8 triangular shaped flange portions 4, 6 respectively
9 either end of the central web portion 2. The
10 structural component 1 defines a longitudinal axis
11 L-L in the direction from the first flange portion 4
12 to the second flange portion 6. The insulating
13 component 1 is symmetrical about the longitudinal
14 axis L-L.

15
16 The web portion 2 has two pairs of fins 48, which
17 extend therefrom in opposite directions and
18 perpendicular to the longitudinal axis L-L of the
19 structural component 1. Each pair of fins 48 are
20 co-planar and are spaced apart from each other along
21 the web portion 2. Each fin 48 is in the shape of a
22 rod having a two prong forked end portion 50. Each
23 prong 52, 54 of the forked end portions 50 have
24 grooves 56, 58 on their inner faces.

25
26 The flange portions 4 and 6 have apexes 8 and 10,
27 side walls 12, 14 and 16, 18 and bases 20 and 22
28 respectively. The web portion 2 extends through the
29 apexes 8 and 10 to meet the bases 20 and 22 of each
30 triangular flange portion 4 and 6 respectively, such
31 that the longitudinal axis L-L bisects each
32 triangular flange portion 4 and 6.

11

1 The side walls 12,14 of the first flange portion 4
2 gradually curve to meet the base 20 at areas of
3 contact A and B defined by a thickening of the side
4 walls 12,14 generally midway along their length.
5 Both side walls 12,14 and base 20 continue to extend
6 beyond their area of contact A and B parallel to
7 each other, spaced apart and perpendicular to the
8 longitudinal axis L-L to define slots 24,26 there
9 between. The slots 24,26 have grooves 28,30 in the
10 side walls 12,14. The free ends of the base 20 are
11 shaped back on themselves away from the web portion
12 2 so that they face each other forming U-shaped
13 sections 32 and 34.
14
15 The second flange portion 6 is similar in shape to
16 the first flange portion 4. However, the free ends
17 of the base 22 are not shaped back on each other to
18 form U-shaped sections, but rather extend a distance
19 beyond the free ends of the side walls 16,18
20 parallel thereto and perpendicular to the
21 longitudinal axis L-L to define slots 36,38
22 therebetween. In a similar fashion the slots 36,38
23 have grooves 40,42 in the side walls 16,18.
24
25 The base 22 of the flange portion 6 also has
26 recesses 44 along a portion of the length of its
27 side remote from the web portion 2. In all other
28 respects, the flange portions 4 and 6 are identical.
29
30 Referring now to Fig. 2, there is shown a section of
31 the wall construction assembly generally indicated
32 by the reference numeral 100, which clearly shows

12

1 the position and function of the structural
2 component 1.

3
4 The second flange portion 6 is attached with screws
5 to a wall panel 102. Insulation restraining straps
6 104 are inserted into the slots 24,26 of the first
7 flange portion 4. The straps 104 have formations
8 thereon(not shown) which engage with the grooves
9 28,30 to resist withdrawal of the straps therefrom.
10 Insulating material 106, indicated by the wave like
11 shading portion in Fig. 2, is placed within the
12 space formed between the wall panel 102 and the
13 straps 104. A spacing block 108 is fixed between
14 the U-shaped sections 32,34 of the first end portion
15 4 and is also fixed to a cladding panel 110. The
16 spacing block 108 provides for a ventilation space
17 between the insulating material 106 and the cladding
18 panel 110.

19

20 Although Fig. 2 only shows a single structural
21 component 1, it will be appreciated that a number of
22 these components, as required, is placed along the
23 length of the wall panels 102, 110.

24

25 The structural component 1 is of a strong material,
26 such as, for example, aluminium or steel. Owing to
27 the shape of the structural component 1, no further
28 support is necessary to maintain the structural
29 integrity of the wall construction assembly 100.
30 The broad profile of the first and second flange
31 portions 4,6 add stiffness and strength to the
32 structural component 1, the web portion 2 adding

13

1 longitudinal stiffness and strength, and the fins 48
2 adding lateral stiffness, strength and overall
3 structural integrity to the wall construction
4 assembly 100.

5
6 In use, the wall construction assembly 100 is
7 capable of providing insulation to any required
8 standard, can be placed about the internal or
9 external walls of a building structure and can be
10 attached to the walls in any conventional manner.
11 However, due to the strength of the structural
12 component 1, the wall construction assembly 100 is
13 structurally very sound and does not need the
14 support of the wall of the building structure and as
15 such does not need to be attached thereto.

16
17 It will be appreciated from the foregoing that the
18 amount of insulation is not limited by the space
19 between the cavity walls of the building structure.
20 As insulation can now be added externally of the
21 walls of the building structure, the thickness of
22 the insulation added is not limited. Different
23 sized structural components 1 can be used for this
24 purpose as shown in Figs. 11 and 12. Where a
25 thicker wall construction assembly 100 is employed
26 it may be prudent to use a greater number of
27 structural components 1 to ensure that the wall
28 construction assembly 100 is structurally stable.

29
30 It will be also be appreciated that various
31 different embodiments of the wall construction
32 assembly 100 may result from the present invention

14

1 and that the structural component 1 can be used in a
2 number of ways. For example; in an alternative
3 embodiment of wall construction assembly 100, the
4 wall panel 110 may be connected directly to the
5 first flange portion 4. Ventilation space may be
6 provided by placing the insulation restraining
7 members 104 between the forked end portions 50 of
8 the fins 48.

9
10 It will further be appreciated that the first flange
11 portion 4 may be attached to the panel 110 in a
12 number of different ways, a typical example being
13 shown in Fig. 7 where one end of a suitably shaped
14 tie 120 engages the u-shaped sections 24, 26 of the
15 first end portion 4, the other end of the tie 120
16 being fixed to the panel 110.

17
18 When using the wall construction assembly 100 on the
19 external walls of a building structure the second
20 flange portion 6 may be attached directly to the
21 masonry wall. This is shown most clearly in Fig. 6.
22 Adhesive may be placed between the base 22 of the
23 second flange portion 6 and the masonry wall. On
24 placement of the second flange portion 6 on the
25 masonry wall, a portion of the adhesive is pushed
26 into the recesses 44 of the base 22 which helps grip
27 and secure the flange portion 6 to the masonry wall.
28 The structural component 1 can be further secured to
29 the masonry wall in any conventional manner, for
30 example, by nut and bolt, screw or fixing.

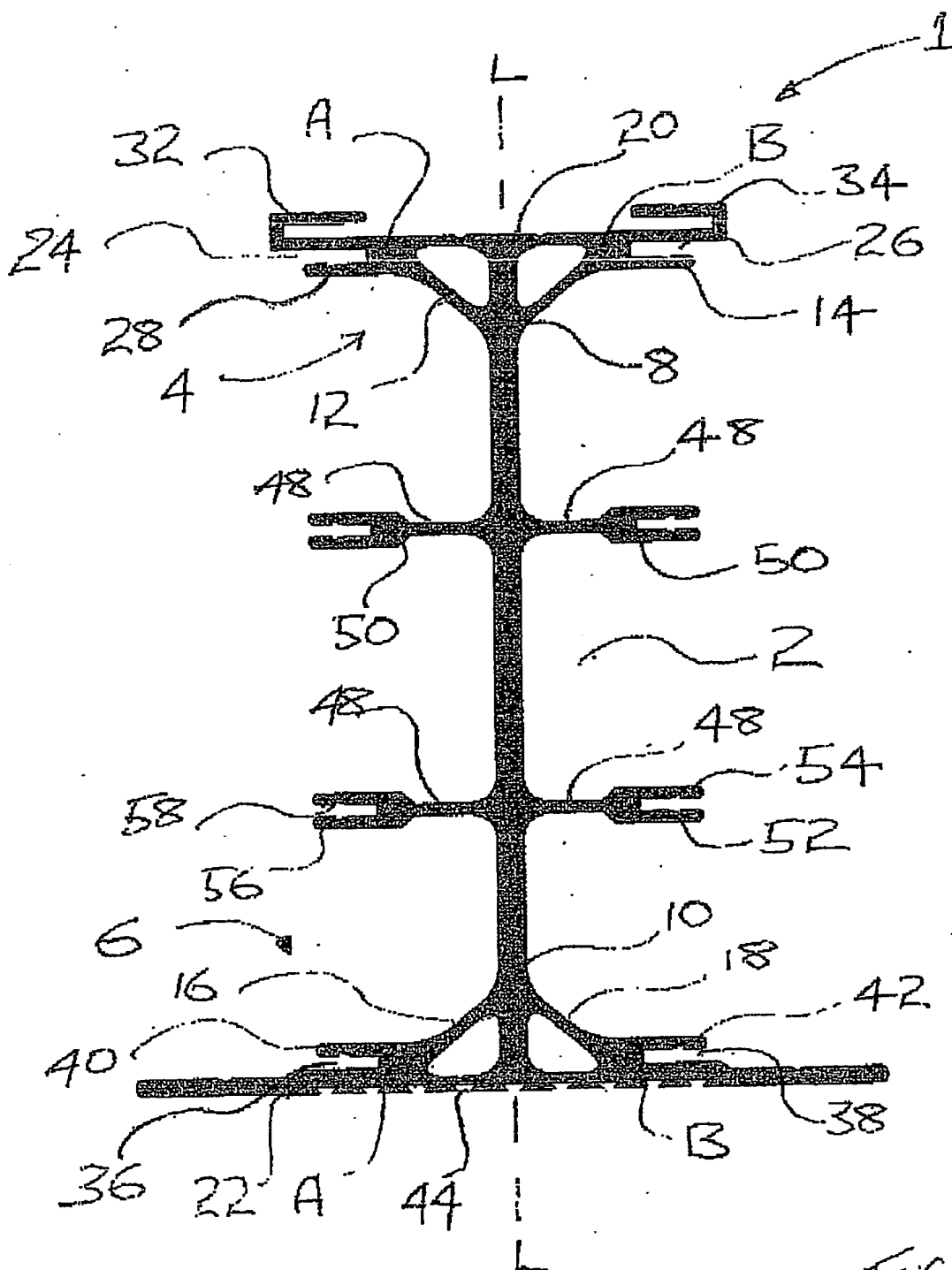
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15

1 It will be appreciated that the structural component
2 1 is also suitable for using in a conventional
3 cavity wall. This is shown most clearly in Fig. 10.
4 Due to the structural stiffness and strength of the
5 structural component 1, the distance between the
6 inner leaf and outer leaf of the cavity wall may be
7 greater than conventional spacing, allowing an
8 increased amount of insulation to be placed there
9 between.

10

11 The invention is not limited to the embodiments
12 hereinbefore described but may be varied in
13 construction and detail.



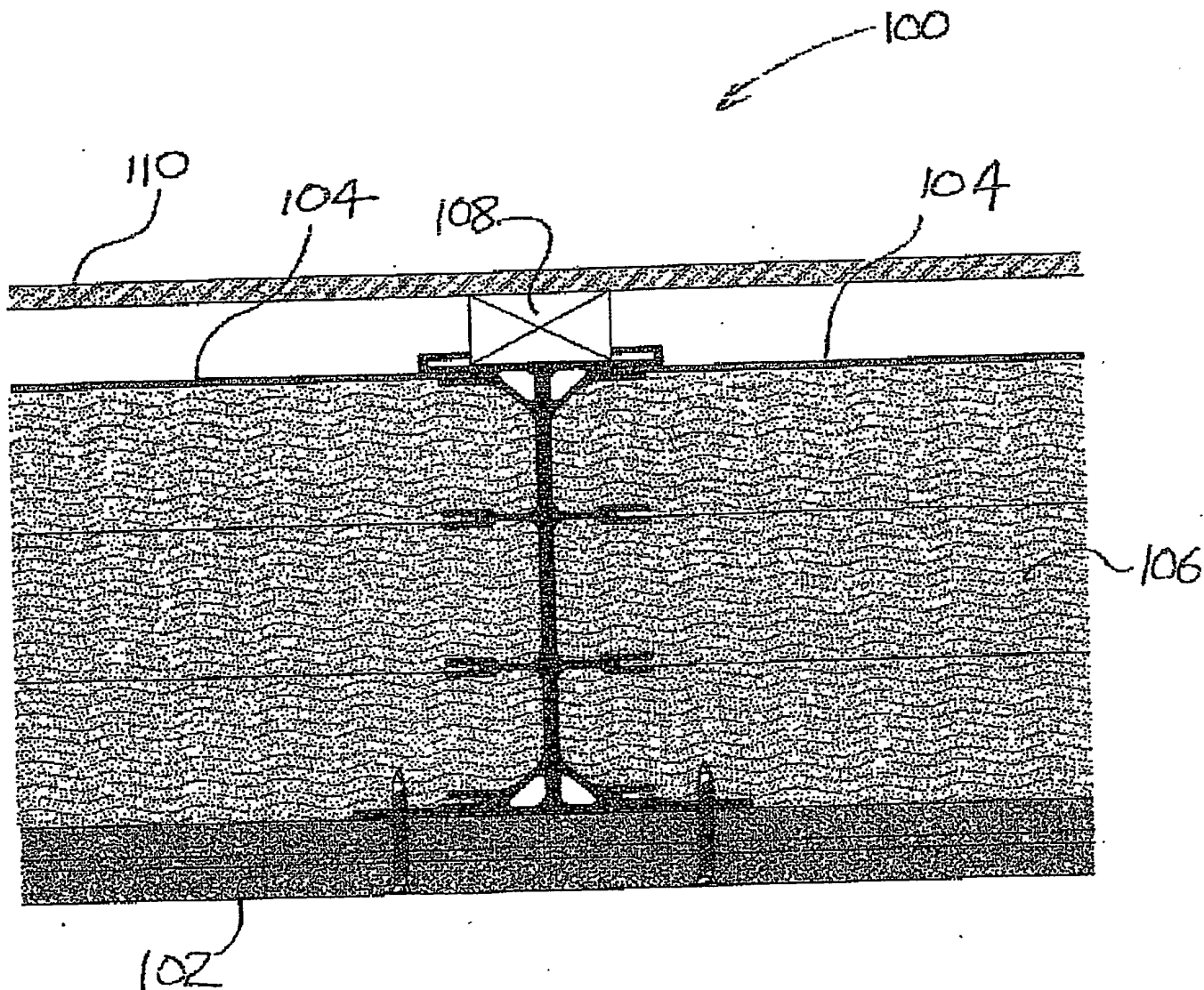


FIG 2

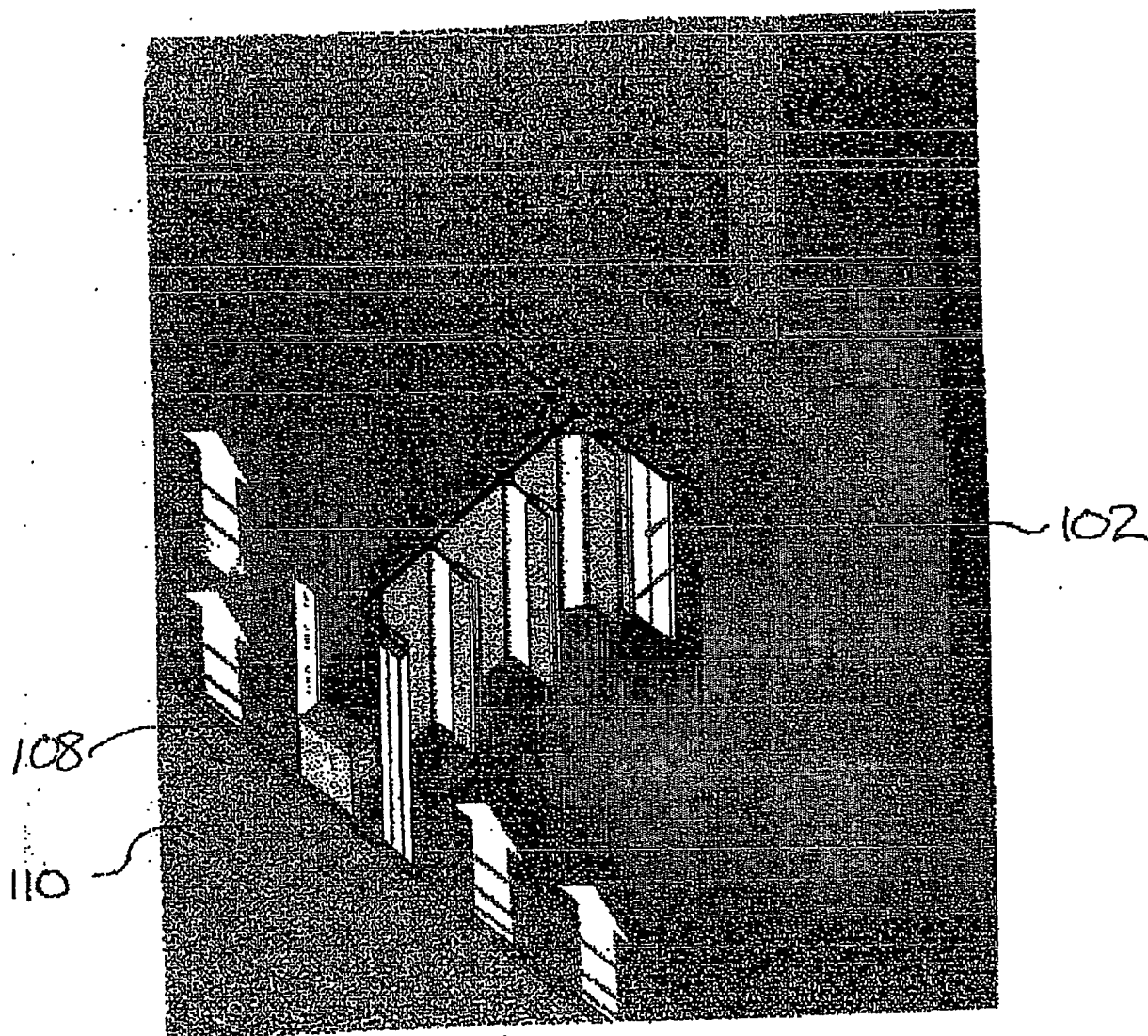


Fig-3

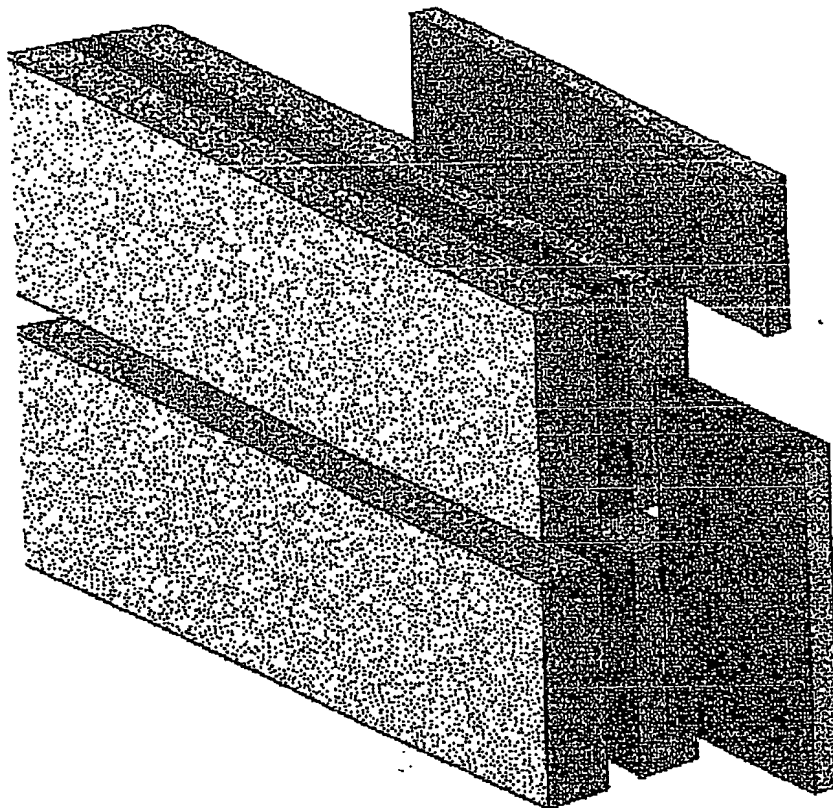


FIG. 4

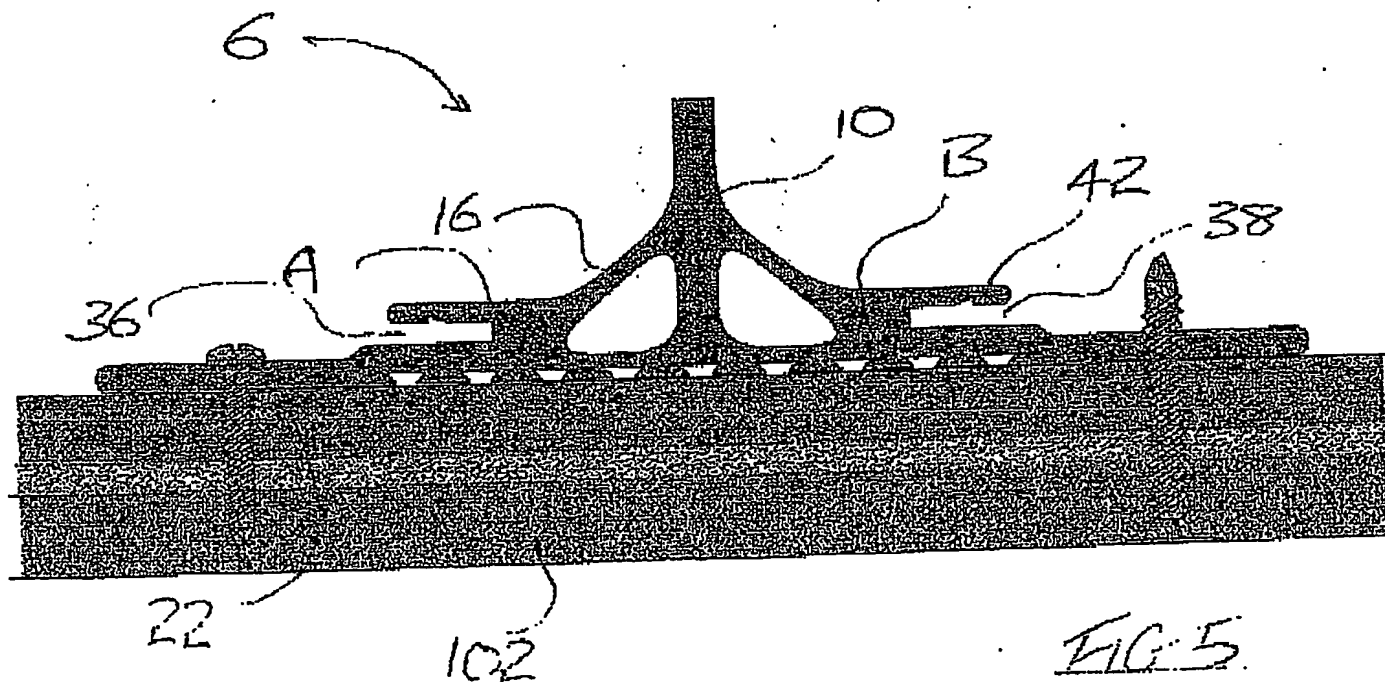
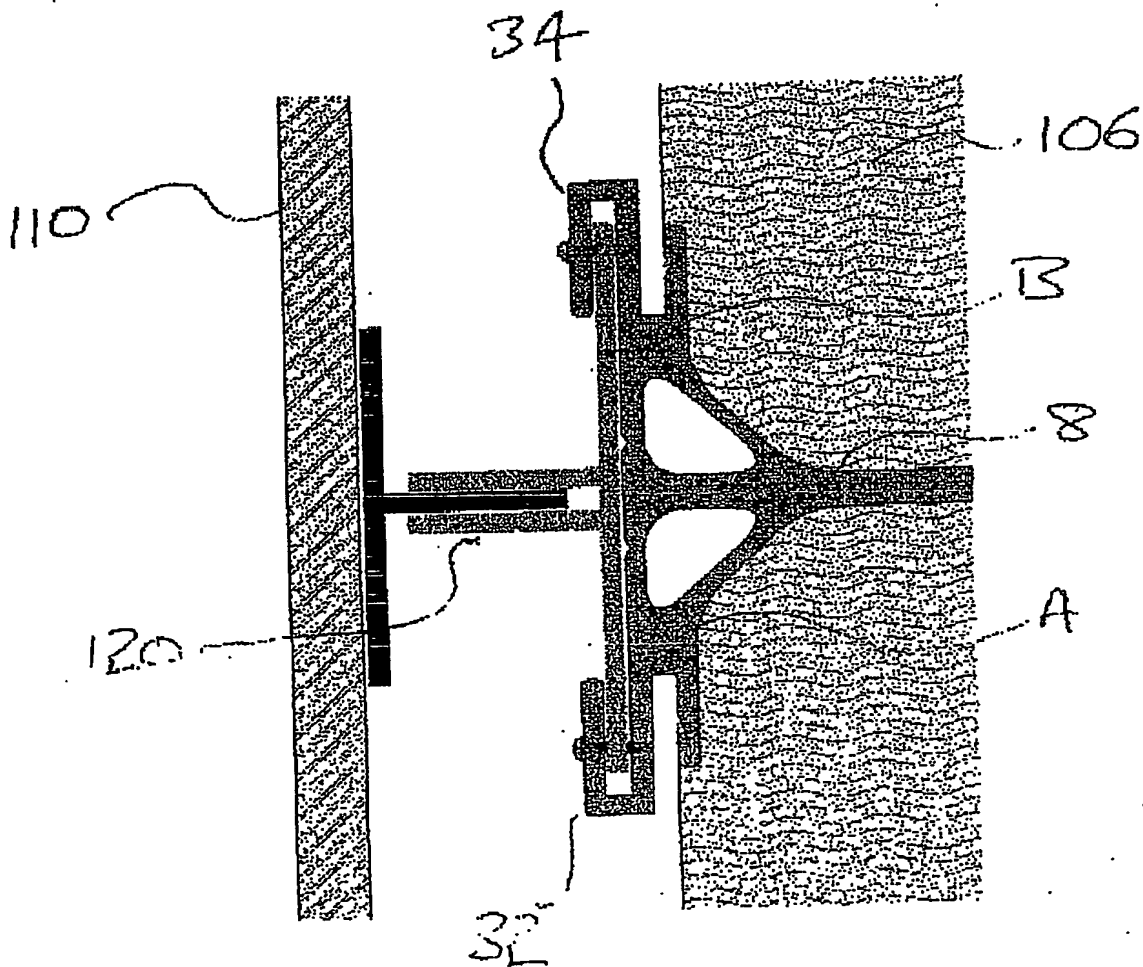
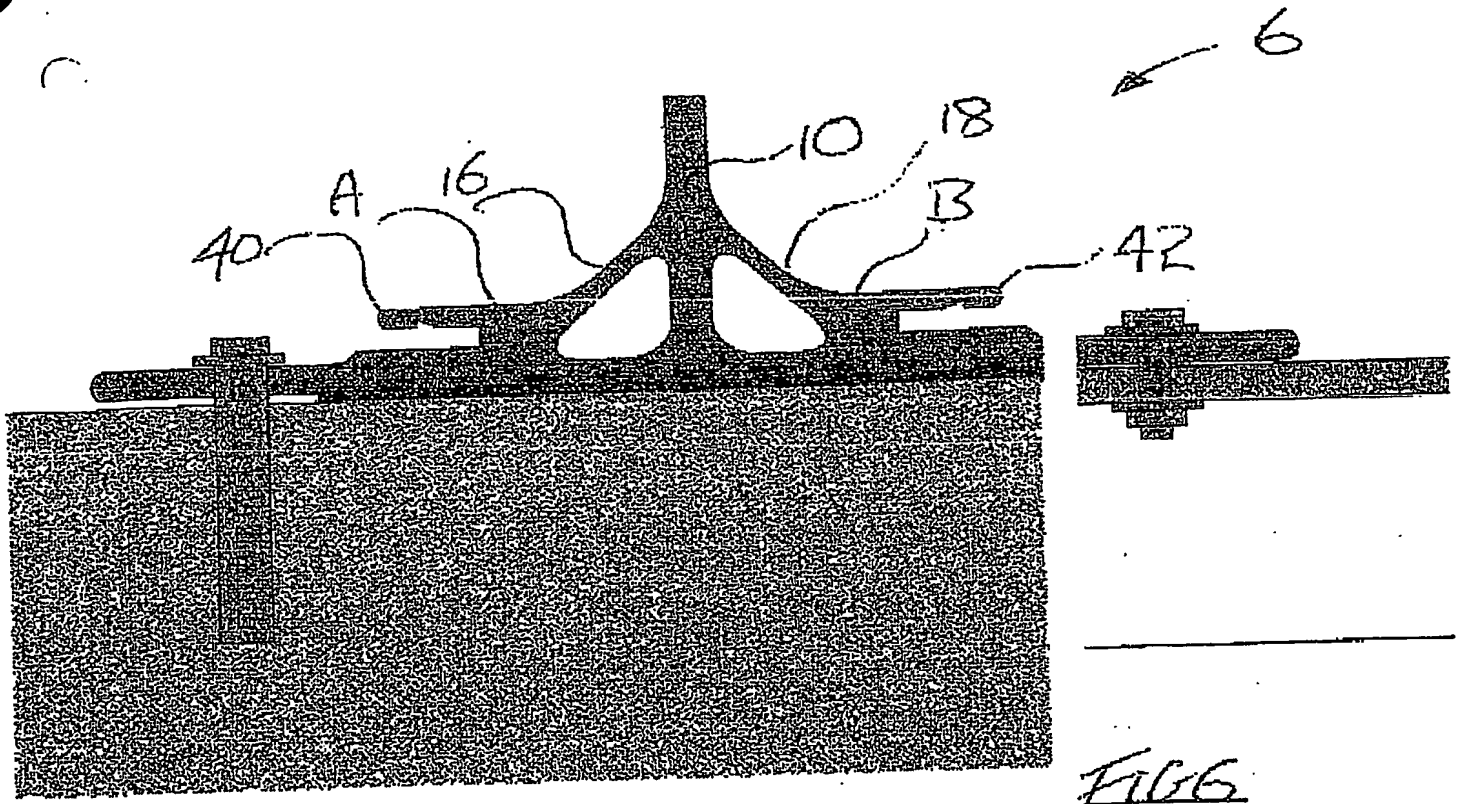


FIG. 5



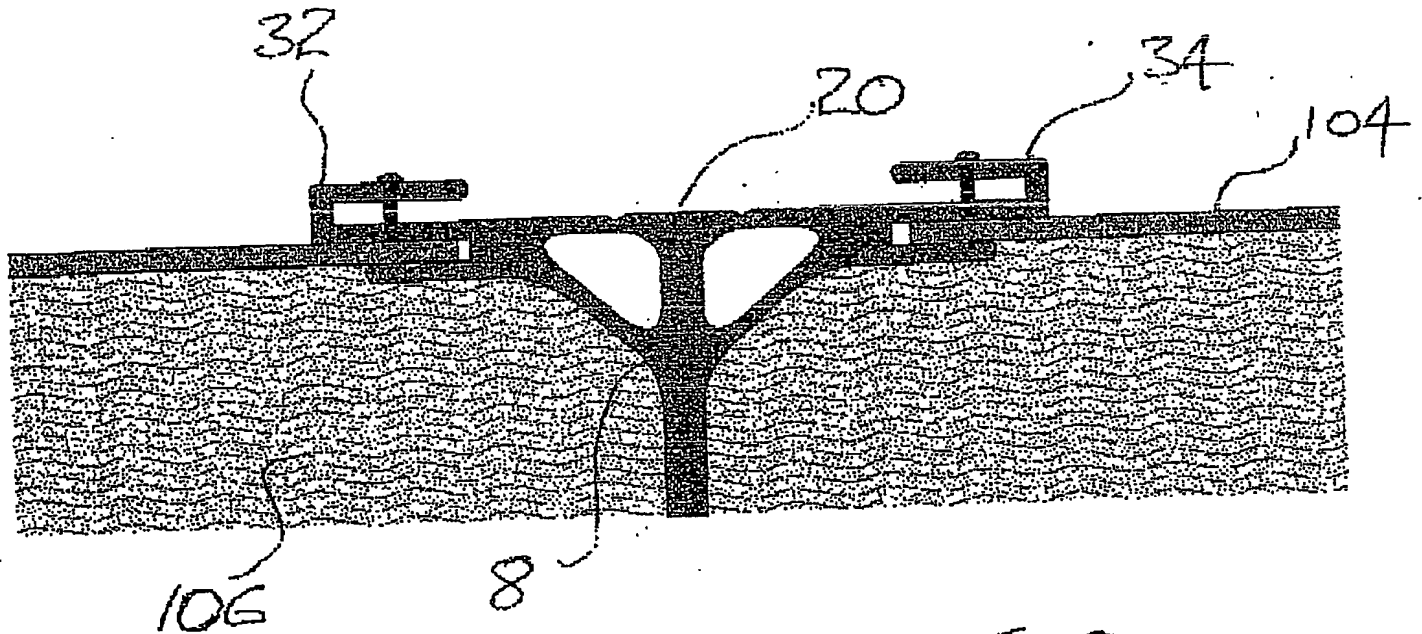
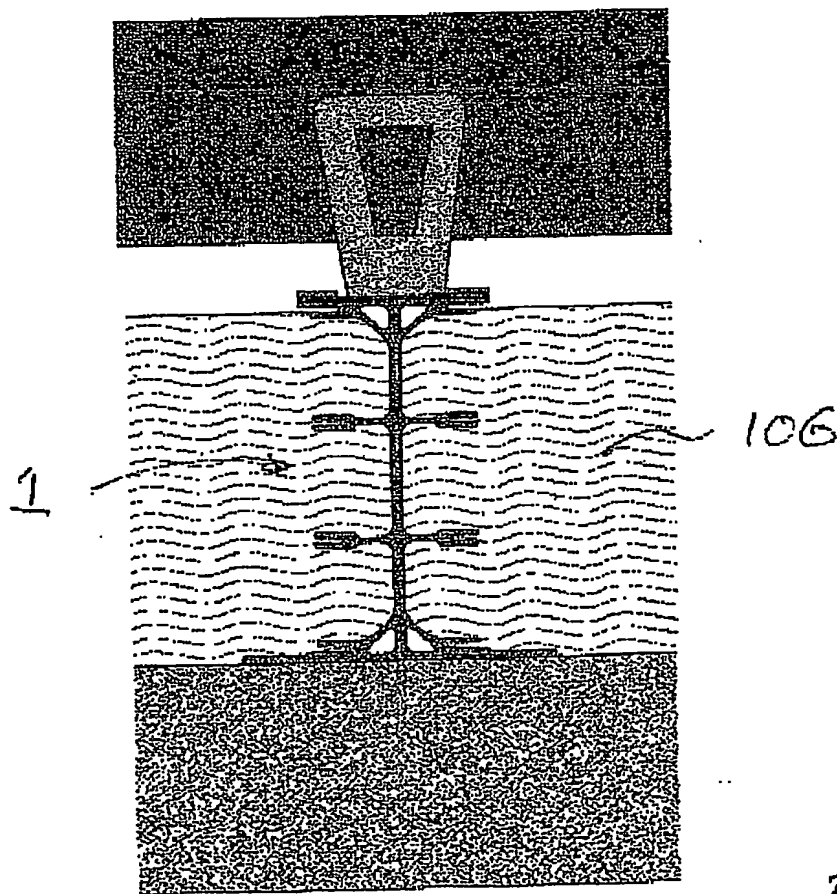
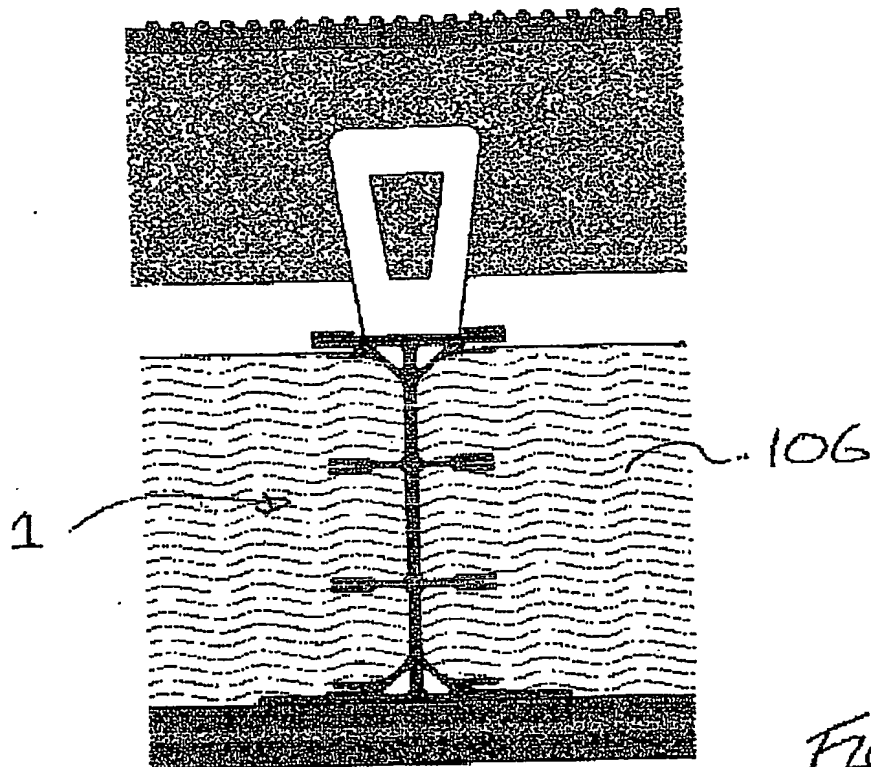


FIG 8



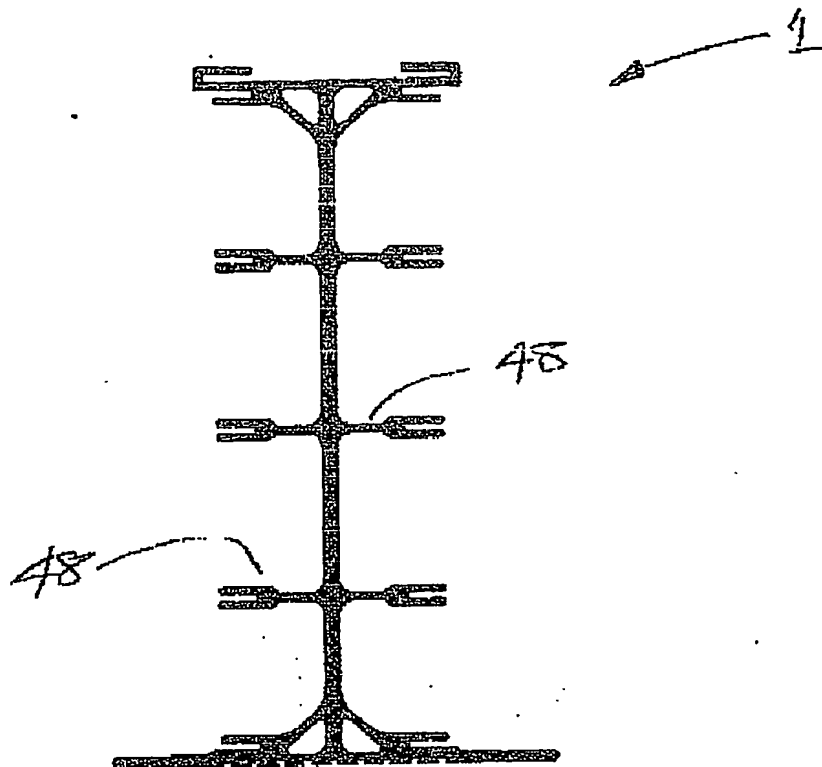


FIG 11

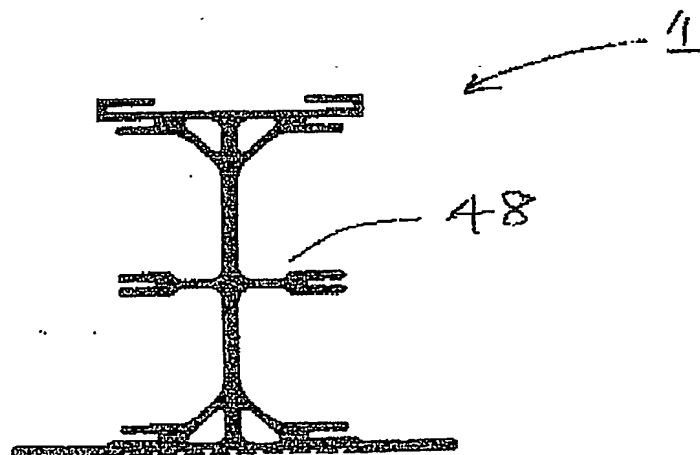


FIG 12

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